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IN MEMORY OF JAMES WILLIAMS SCOTT

THIS NUMBER IS DEDICATED

EDITORIALS

Just now men are realizing more than ever the immense importance of securing the best possible training before accepting positions in the industries, because few college men are content to continue as routine analysts, and this is about all there is for the poorly equipped man. This conviction is especially prevalent among the men who have been engaged in chemical work in essential war industries during the war, and among enlisted chemists who are now returning home. With this in mind, many of these recent graduates in chemistry are seeking post-graduate work in the colleges and universities as the best preparation for rapid advancement when they do go out into commercial laboratories. They are not pursuing this course purely from the standpoint of personal gain, because they wish to play an important part in the new era of chemistry that is just dawning.

This idea of maximum preparedness in colleges is fundamental at this stage of the development of the stable and enduring Ameri-

can chemical industries, because, if the men in our research laboratories are better trained and more numerous than those of any of our competitors, we shall establish ourselves all the sooner in this, the newest of the fields which we have chosen to dominate. We believe the farseeing men of the country appreciate to the fullest, the strategic importance of having only the most carefully trained men in responsible positions in their research laboratories during the coming war of competition in trade, and will, for this reason, encourage men to take advantage of every opportunity to increase their technical training before leaving college—or by returning to college, as the case may be. We believe that too much stress cannot be laid on this point: it is the key to success.

Happily the movement is already started. This flocking-back to the college laboratories will also have a most gratifying effect on the quality as well as the quantity of research done by them. And in this age of fierce struggles, the spirit of conquest will inspire the students to do their best, for the Hun has been beaten on the battlefield largely by the aid of Chemistry—and he will be equally well met in the laboratory.

Perhaps there is an element of Utopianism in the hope that we are to soon have a new and up-to-date laboratory building adjoining the present Chemistry Hall, but wilder dreams and more intangible fancies have been realized in the past, and that gives us encouragement. Our hope is to see the present building given over to classrooms, the library, offices, and probably general chemistry laboratory, and a new modern building erected which will contain all the analytical and research laboratories. This would be an ideal arrangement, and would meet the needs of the department for the next decade.

The great strides made in Chemistry in this country during the past few years warrant great preparations for the near future, for Chemistry is no longer a black art; the cunning, mysterious alchemist in his lonely cellar with his diabolical secrets is gone; and today, Chemistry, so far as is known, is an open book to the inquiring mind. The good that it has accomplished has surpassed the evil done many fold. Therefore, we believe that in order to keep pace with the growing importance of the science, we must speedily improve and enlarge our equipment substantially.

Here lies a wonderful opportunity for some great-hearted alumnus or retired philanthropist to perpetuate his name, and at the same time render a noble service to his country by providing ample space and facilities for the pursuit of knowledge and truth by the sons of the Old North State.

ALUMNI SUPPORT THE CHEMIST

We have temporarily abandoned the scheme of sending return post cards to the alumni to obtain information concerning them, and we are now depending upon the Alumni Review for your address. Therefore, if you have not heard from us previously, your copy of THE CAROLINA CHEMIST will be an invitation to mail us a check for any amount up to one dollar to assist in defraying the expense of printing the two issues proposed for this year.

We would also appreciate it very much if you would loosen up and write an article for THE CAROLINA CHEMIST about your work. Your former classmates would be glad to learn of your whereabouts and your occupation. Your success will also encourage those of us who have not yet finished our work here.

A NEW FACULTY MEMBER

Last fall the War Department sent us, on unlimited furlough, Dr. J. T. Dobbins to help instruct the students of the S. A. T. C. in Chemistry. During the holidays, he received his discharge and since that time he has been teaching most of the courses given by Dr. Herty just previous to his departure from the Department.

Dr. Dobbins received his Ph.D. degree here in 1914, and immediately accepted a position on the teaching staff of the A. and E. College at Raleigh where he has been teaching Chemistry ever since. Last summer he was drafted and sent to Camp Jackson, but was released after three weeks to come here.

We are very glad indeed to have Dr. Dobbins with us. He is a quiet, thorough, business-like fellow who attends strictly to his own business—and does it well. We do not hesitate to predict a most successful career for him at the University.

CHEM. 21

A brand-new course was added to the chemical curriculum last fall. It was called a course in chemical instruction, and was open to Juniors and Seniors doing work as assistants in the various courses, and who were also in the S. A. T. C. Since the S. A. T. C. has been disbanded, Chem. 21 will probably not be given again, as "credit" alone is not a popular remuneration for assistant's work in the laboratory.

GENERAL CHEMISTRY LABORATORY

Probably every instructor who has had anything to do with the General Chemistry Laboratory here has felt the force of its limitations with respect to equipment, reagents, etc. With the increasing number of men taking this course, the old conditions became unbearable, and after some discussion, it was agreed to remedy, in some respects at least, the unwholesomeness of the situation.

We have now a laboratory in which each desk is fitted with a fairly complete set of apparatus. The reagent shelves were also entirely removed, and a complete new outfit installed, in which the chemicals are arranged alphabetically; and to add to the convenience, two complete sets have been placed in the laboratory.

A further improvement looking to an increase of available floor space is contemplated. This plan, which proposes to substitute three drawers for each locker with a door, is scheduled for execution during the summer vacation. When this scheme is carried out the capacity of the laboratory will be doubled. We are indebted to Dr. Dobbins for this last suggestion.

THE LIBRARY

It is very gratifying to us to see the library grow. Last spring Wm. R. Kenan, Jr., '94, of Lockport, N. Y., presented the University with bound sets of the following journals, complete to the end of 1916: *Journal of the American Chemical Society*, *Journal of Industrial and Engineering Chemistry*, *Chemical Abstracts*, and *The Journal of Analytical and Applied Chemistry*. More recently, he has brought the three Chemical Society Journals up to date (end of 1918).

It might be of interest to the Alumni to know that the library has been moved from room 3 on the main floor to room 17 on the second floor. This change was made in order to insure the books against floods from the general chemistry laboratory which is directly over room 3. The new library room is larger and is also better arranged with respect to book shelves, and reading room, in that there are now two reading tables instead of one.

CHEMICAL FEED

When the magic word "feed" is mentioned within the hearing of a chemist, he suddenly becomes interested and attentive, and a hungry gulp percolates down the inside of his collar. This is true of Chemists in general, but the annual chemical feed at Carolina has a special significance to all concerned: to the new men it affords an opportunity of seeing for the first time all of the men of the Department, participating in an informal merry-making performance where there is no subtle hint of quizzes; to the older men, it offers an opportunity to size up the Freshmen, and speculate on the future of their successors, and for those inclined to talk, it is the occasion of the biggest "bull session" of the year. As a matter of fact, it is really a get-together meeting by the Department for the purpose of starting the new year right, and as such, it exercises an important function in establishing and renewing pleasant relationships between the students and faculty. For these reasons, it is always looked forward to with eager anticipation by the "inhabitants" of Chemistry Hall.

During the last days of October last fall the annual feed was held, as usual, in the workshop in the basement of the Chemistry Building. About sixty Chemists assembled to partake of the feast, and enjoy the speeches. Drs. Venable, Wheeler, and Dobbins gave interesting discussions and reminiscences. These were followed by the Seniors of whom Cummings especially distinguished himself as an orator. The Juniors then held the floor for three minutes each, or less.

But the one never-to-be-forgotten event of the evening was "Red" Daughton's speech. Daughton was much surprised when called upon, and as he stood up, exclaimed, "Rats, if I had known this, I wouldn't have come." But he controlled himself and told us that he had once been in love and that it was the "real thing too."

However, in the last half minute, he said that he had rather work in the laboratory than talk to his best girl any day.

WHO WOULD HAVE THOUGHT IT?

Sometimes it is interesting to know just how much progress a class is really making, and of course, there are very many effective means of finding out. During the fall term (in the reign of the S. A. T. C.), some one wished to check up General Chemistry in an unexpected manner, so the following question was slyly inserted in the quiz next to the last, "What is the molecular weight and formula of boiling water?" Only 40 per cent of the class attempted to answer it, and only about half of these gave the correct answer. Below are some typical answers. "There is no molecular weight and formula of boiling water." "The molecular weight of boiling water is 33.008." "When water is heated, it evaporates, forming oxygen and hydrogen, its formula is H_2O , its molecular weight is nothing."

JOURNAL CLUB MEETINGS

During the fall quarter the Journal Club held no meetings owing to the fact that, under the S. A. T. C., no time was available to hold meetings. But with the resumption of the regular college program, the fortnightly meetings are in regular order; and with the augmented number of upperclassmen, it is hoped that much good work will be done during the ensuing two quarters.

On January 20th Dr. Venable presiding over the meeting at which there were thirty men. The subject discussed was, "The Government Nitrate Plant at Mussel Shoals, Ala. Messrs. Smithey, Smith, Jackson, and Moore presented papers in an interesting manner, tracing the process from the beginning to the ultimate products, nitric acid and ammonium nitrate.

FOUR YEARS OLD

The CHEMIST is now starting on its fifth year, and it feels somewhat proud of the fact that it is four years old. True enough, it has traveled the path somewhat irregularly, and the various numbers have not appeared with the methodical certainty of

Chemical Abstracts, yet, it has succeeded in maintaining its existence, and it sincerely hopes that it has accomplished some good by doing so. In the future the policy will be to publish two numbers each year; one in February and the other in October.

As a matter of information, we are publishing a list of the previous issues of the CHEMIST with dates.

1915. Vol. 1, No. 1—January.	1916, Vol. 2, No. 3—November.
1915, Vol. 1, No. 2—February.	1917, Vol. 3, No. 1—April
1916, Vol. 2, No. 1—February.	1918, Vol. 4, No. 1—February.
1916, Vol. 2, No. 2—April.	1918, Vol. 4, No. 2—April.

In case any of our alumni or others should wish to complete their files, we will be glad to furnish back numbers as long as they last at 50 cents each. We cannot supply any of Vol. 2, No. 2, 1916.

ALPHA CHI SIGMA

By H. G. SMITH

The Rho chapter of Alpha Chi Sigma is now in a state of jubilant rejoicing over the safe return of five of its war heroes, after having been forced to exist with a personnel of only two men, Ed. Wood and Gillie Smith. During the fall we leased our chapter house for the year in order to keep down expenses and comply with the Government's request in regard to the fraternities.

Now with the return of Holmes Sawyer, Second Lieutenant, U. S. A.; Joe Murray, First Sergeant, Motor Transport; Scodie Dawson, C. P. O., U. S. N. R. F.; Shorty Cordon, Intelligence Officer, U. S. N. R. F.; and J. P. Sawyer, C. P. O., U. S. N. R. F.; and with the promised return of Holmes Herty, C. W. S., we expect to soon take our old place as an active chapter in the proceedings of all things Chemical at Carolina.

Initiation was conferred on Thomas L. Pace of Oxford, N. C., January 20, 1919.

SUMMER ACTIVITIES OF FACULTY AND STUDENTS

By R. H. SOUTHER

Dr. Venable taught in the Summer School. He devoted his spare time to performing his duties as a member of the General

Advisory Board for the Bureau of Mines. Dr. Venable was also a member of the Advisory Board for Chemical Warfare Service, Ordnance Department.

Dr. Bell was engaged in research work with the Dispersoid Division of the American University at Washington. One of the chief problems confronting this division was the utilization of Smokes and Artificial mists for war purposes. Dr. Bell's prospective year's leave of absence was cut short by his recall to the University when the Students Army Training Corps was organized.

Dr. Wheeler also taught in the Summer School. He spent the remainder of the vacation period in the mountains. During his stay in the "Land of the Sunset Sky," Dr. Wheeler visited the Champion Fibre Company's Paper Mill at Canton, N. C. This mill is a great chemical asset to the State.

I. W. Smithey spent the summer making naval stores investigations for the Bureau of Chemistry. The greater part of his time was spent in touring the South Atlantic States, collecting data for the War Industries Board on the cost of production of naval stores.

J. P. Sawyer, who entered the C. W. S. last spring, worked on smokeless powder at the Naval Proving Grounds, Indian Head, Md. Later he was transferred to Philadelphia as inspector of TNT for Barrett Company.

After a sojourn of two months in his home town as analytical chemist for the Charlotte Chemical Laboratories, Inc., Ernest Neiman responded to the call of the North and spent the remainder of the summer visiting in Washington, Baltimore, and other northern cities.

H. G. Smith was control chemist of the TNT boiling house, Aetna Explosives Company, Mt. Union, Pa.

T. P. Dawson, C. W. S., worked on Ammonium Pierate and TNT at the Naval Proving Grounds, Indian Head, Md.

J. S. Murray was analytical chemist for the Emerson Drug Co., Baltimore, until he entered the Second Plattsburg Camp. Later he joined the Motor Transport Corps, and remained at Charlottesville, Va., until discharged.

P. O. Jarvis was in Chemical Warfare Service, at American University Experimental Station. He was with the Dispersoid Section of the Research Division.

W. B. Richardson journeyed over to Akron, Ohio, where he worked with the Goodyear Tire and Rubber Company.

A. C. Cecil entered the Chemical Warfare Service at American University. He worked on tear gases.

E. O. Cummings applied his practical knowledge as a moving and erecting engineer in the State.

Holmes Sawyer won his commission at Plattsburg and was sent to Dickinson College, Carlisle, Pa. Before going to Plattsburg, he was employed by the Government in the construction of the Government Hospitals at Azalea, N. C.

The Juniors chose rather diverse lines of occupation.

D. H. Jackson and S. C. Smith, who came to us from Guilford, worked with the Research Division at the American University, Washington.

C. C. Carter caught the spirit of the west and went to Akron, Ohio, to accept a position with the Goodyear Tire and Rubber Company.

F. H. Spry purchased a hammer and saw, and assisted Uncle Sam in building his Naval Base in Norfolk.

E. B. Cordon enlisted as a seaman in the Navy and was stationed at Norfolk. For a while he was intelligence officer, later being transferred to a submarine patrol.

H. S. Terry was inspector of Army duck in a government plant at Rockingham.

N. W. Taylor accepted a position as chief salesman for a large department store in Beaufort, N. C.

C. B. Ridge was content to remain in his home town, choosing employment with a local furniture factory.

The new shipyard project at Wilmington drew T. L. Pace down that way.

R. H. Souther was an electrical "trouble shooter" in the armor plate mill of the Bethlehem Steel Company, Sparrows Point, Md.

K. L. Pinnix was employed at a shipyard in Newport News, Va.

O. E. Moore attended the Summer School.

Woodford White followed Chemistry into the industrial world, and spent the summer getting "beautiful" end points for E. I. DuPont over at Hopewell, Va.

RECENT RESEARCH BY THE DEPARTMENT

H. G. SMITH

Perhaps the one concrete thing that goes to make up the morale or "spirit" of the department is its research. The original investigations of the graduates put the second-to-none brand on the Carolina chemists, and maintain the high standing of the department. But as everything else felt the ravages of war, so it was with Chemistry 23 during the short life of the S. A. T. C. Carolina was unfortunate enough to have only three men in her class of Senior chemists during the fall. These men found out that drills, bugle calls, formations, etc., did not agree with an investigator's schedule. However, despite the disadvantages, much studying was done during the leisure hours of the soldiers and "Land Gobs" in the three big fields of Organic, Inorganic, and Physical Chemistry.

E. O. Cummings, under the direction of Dr. Bell is working on a method of analysis of mixtures of TNT, DNT, and MNT by the use of the refractive indices and freezing curves.

W. B. Richardson and H. G. Smith are being directed by Dr. Wheeler in their efforts to devise a commercial method for the preparation of juglone from naphthalene. The methods used thus far in experiments have been to sulphonate the naphthalene at 0° forming the di-sulphonic acid. This was then converted into the sodium salt, and fused with sodium hydroxide, thus producing dioxy-naphthalene. Juglone is obtained by oxidizing this product with chromic acid.

I. W. Smithey, under Dr. Venable, is doing original investigation in the preparation of the salts of the oxy-nalogen acids with zirconium. Analyses of zirconium per-chlorate indicate the formula $\text{ZrO}(\text{ClO}_4)_{2.1}\text{H}_2\text{O}$. The iodate has only recently been prepared, but it appears to be a fairly stable compound.

Dr. Dobbins with Dr. Wheeler is investigating the reactions between phenylsemi-carbazine and acetyl-acetone.

Dawson, Murray, and R. H. Sawyer, are studying the methods of purification of cymene from spruce turpentine, and its value as a solvent of the organic compounds. Dr. Wheeler is in charge of the work.

E. Neiman is working on the reactions of parabromphenylsemi-carbazine with ketones. Dr. Wheeler is in charge of the work.

J. P. Sawyer, with Dr. Bell, is continuing the study of the preparation and properties of tri-nitro-xylol. This is a new explosive in which the Navy is interested.

THE HIGH SCHOOL DEPARTMENT

In order to further the interest in Chemistry among the high schools of the State, THE CAROLINA CHEMIST is broadening its efforts to bring to them interesting and valuable knowledge concerning Chemistry as a science, as well as information concerning special fields of Chemistry. In pursuance of this plan this year, it will visit many more schools than ever before and will bring to the students interesting facts about their old acquaintances now at the University, or in some line of chemical work in the industries, or in the service of the nation. It will also give a glimpse into the heart of the Chemistry Building and show the chemists something of the work being done here, and more than that, it will try to convey an idea of the spirit that prevails here. And what is of equal interest to the high school boys and girls, the first of a series of papers dealing with popular subjects in Chemistry will appear in this issue also.

We sincerely hope that the superintendents and principals of the schools, to whom THE CHEMIST is sent, will coöperate with us at least to the extent of seeing that the paper reaches the members of the Senior class. More copies will be mailed on request as long as they last.

GAS WARFARE

BY DR. F. P. VENABLE

So much has been written about the war gases that it is difficult to find anything new to write concerning them. The thought that they might be used seems to have prevailed early in the Great War and correspondents sent out some wonderfully detailed stories as to the use of hydrocyanic acid by the French in the first battle of the Marne. The truth is it proved to be impracticable to use this sub-

stance on account of the difficulties in securing a toxic concentration, nor is there any proof that the French attempted it. The Germans were the first to make use of war gas in the form of waves of chlorine, but after the first surprise this proved ineffective and often did more harm to the senders than to the enemy whom they wished to destroy. Like any other weapon of war the development of gas-attacks had to come through trials, failures, and, in this case, careful scientific work. The gas-defense also developed almost as rapidly as the offense and two sets of chemists were kept busily employed on both sides trying to outwit and outdo one another.

It was soon seen that the gas must be delivered from a considerable distance to avoid the disaster of a shift of wind. This meant shells loaded with materials which would form gases on exploding. Compressed or liquefied gases could not be used very well so liquids or even solids were loaded into the shells along with a booster which on exploding turned them into a vapor rapidly diffusing in the air. The effect depended upon two factors, concentration and time of exposure. Generally the effort was directed at producing a high concentration, which in a short time would have a deadly or disabling effect though low concentrations were sometimes used over wide areas, sapping gradually the resisting power of the troops. The shells contained an average of about five pounds of each liquid, large ones holding twenty to twenty-five pounds. I have seen a twenty-five pound shell explode and the gas rolled and wreathed in clouds which covered the summit and sides of a hill.

With increasing ingenuity smoke shells were devised which delivered a smoke of fine particles which were not absorbed by the masks. This smoke irritated the skin or produced sneezing, causing the wearer to take off his mask and expose himself to the toxic gas which was always thrown over at the same time. These sneeze gases or sternutators formed the study of what was known as the Dispersoid Division of the Chemical Warfare Service and again there were offense and defense sides and the defense won out. Then both sides turned their attention to rendering the masks useless by clogging them up so that the inhalations were stopped. This was working out very nicely for the Allies when the war came to an end.

It was a war of wits between the chemists, and the Allied chemists rather took the lead after the game was once well under way,

and at the close it looked as if America had some very fine trumps which promised to take every trick. Of course the other fellows might have found a trump or two also, but their masks were becoming very defective and little that was new was being offered by them to our laboratories for examination. A strong corps of expert chemists were on every battle-field gathering duds and samples of air for analysis so as to keep up with each new device.

Our alumni were well represented in every field of the service, from dud-hunting to gas production and many of them were gassed at various times for it was a dangerous service.

RESEARCH AT THE AMERICAN UNIVERSITY, WASHINGTON, D. C.

BY R. H. SOUTHER

The foundation of the American University at Washington, marks the beginning of a new era in the chemistry of America. During the war, thousands of the best-trained technical men of the country gathered here to solve the problems of gas warfare. As a result of their efforts there was a greater output of gas than that of England and France combined, in addition to the production of a preëminent American gas, which, when perfected, would have cleared the entire world of the horrible Hun. Their greatest contribution to science, however, does not wholly lie in the field of gas research. Still greater progress was made in the invention and development of new compounds, processes, and apparatus which are of great importance to our industries. Commercial production will replace laboratory preparation, and no longer will America appeal to Germany for dyestuffs and other chemical products. The marvelous achievements of the Research Division, C. W. S., is sufficient evidence in itself that America is chemically independent of the outside world. The ingenuity of the American chemists—their ability to do things and do them well—has been clearly demonstrated in the Research Laboratories of the American University. If peace problems are tackled with equal ardor and enthusiasm, it is reasonable to suppose that America will soon be leading the world in the science of Chemistry. It would be impossible in this short article to give a detailed description of all the investigations of the Research Division, but here are a few of

the great American Chemical discoveries, as quoted from an article by W. E. Brigham in the *Boston Transcript*:

When the armistice was signed America was making more of some of the most useful toxic gases than England and France combined.

Mustard gas has proved to be the most effective substance of its kind now in use, "the premier of them all."

Much credit for the development of certain novel American gases is due Captain W. Lee Lewis, working at the fine laboratory of Catholic University, which also was loaned to the Government.

Millions of dollars worth of American poison gas was rendered useless by the armistice; most of it, enclosed in steel cartons, may be sunk in the deeper parts of the sea, where it never can do appreciable harm.

Thousands of animals were used in the American chemical tests, but so were also hundreds of officers and men, who volunteered or experimented on themselves.

In the great shell-filling plant at Edgewood, Md., gas casualties in some cases of work at first reached 100 per cent. The heroes were not all in the trenches.

About 90 per cent of mustard gas casualties are due to skin burns.

Seventy-five tons of gas were fired on the Allied front at the Germans in one day.

Captain G. A. Rankin so improved on French anilite, hitherto unstable, that mixed benzene and nitrogen peroxide could be kept in one compartment.

Americans designed a successful 100-pound gas bomb and two types of darts, in addition to lead and enamel linings for gas shells.

The Allies ordered 4,000,000 of Dr. Tolman's device for dispersing poisonous solids.

Phosphorus is the banner smoke producer, and during the war the United States made enough phosphorus to screen the world.

Gas shells develop more "duds" than any other class, because of the extreme difficulty of designing a charge that will open the shell without throwing the contents too high to be effective.

Little progress was made during the war in developing compounds or devices that would be of practical utility on the battle-

field in neutralizing enemy gases. The Germans destroyed mustard gas on the ground with bleaching powder.

The French mask, as improved by the Americans, is the finest in the world, and will have important uses in mining, etc. It is now so simple that a man may sleep in it.

On the western front the wind blew from the Allies to the Germans about 75 per cent of the time. The range for gas cloud attacks was usually a few hundred yards, but casualties have occurred several miles back of the line.

Helium has been extracted in large quantities from natural gas to be used as a non-inflammable filler for war balloons.

A special absorbent for carbon-monoxide has developed for use by the Navy in gun turrets.

Liquid arsine was made in quantity, though not used, and a special defense against this gas was developed.

Methods were worked out for detecting mustard gas in concentrations of 1 part in 10,000,000, to enable soldiers to tell when an area was free from mustard gas.

One efficient smoke producer was prepared from sand, and another from rutile, an oxide of titanium found in Virginia.

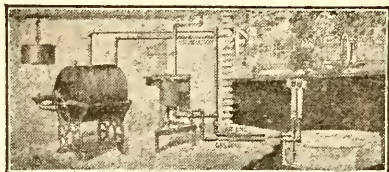
The susceptibility of different animals varies much with the nature of the gas. Thus phosgene kills cats, rabbits, monkeys and guinea pigs more readily than goats or dogs; while chloropierin kills goats, monkeys and guinea pigs more readily than dogs, cats, rabbits or rats; and diphenyl chlorarsine kills goats, dogs, cats, monkeys and guinea pigs more readily than rats and rabbits. Facts like these explain the necessity of using so many kinds of animals.

Horses can stand about 1,000 times the concentration of a tear gas as a man. Consequently it has not been necessary to develop eye protection for horses—an important consideration in using mounted soldiery or police in quelling a mob with tear gas.

As stated above the most effective gas used by the Allies, is the so-called mustard gas, or dichloro-ethyl sulfide, $(CH_2ClCH_2)_2S$. Although not deadly like the poison gases, it produces painful burns, from four to twelve hours after exposure. It also attacks the eyes, causing conjunctivitis and temporary blindness. In a majority of cases, it causes inflammation of the trachea and bronchi, and the development of secondary bronchitis or broncho-

GAS FOR LABORATORY AND INDUSTRIAL USES

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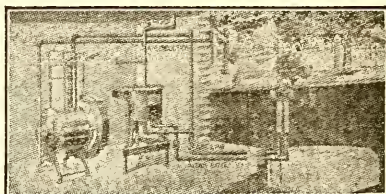
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pneumonia. This gas will produce burns on some men after an exposure of fifteen seconds, while others are barely affected after an exposure of five minutes. It is interesting to note that negroes are more resistant to mustard gas burns than whites.

Since the great quantities of gas stored in this country have no economic value, it becomes a question as to the value of these recent discoveries. Will not the proposed League of Nations outlaw the use of gas in future wars? Some, however, suggest even humane uses for the tear gases. For instance the police might use it effectively in dispersing riotous mobs and send them home, weeping, but without permanent injury.

Whatever action the proposed League of Nations may take in regard to its use, poison gas will probably retain its front rank with shrapnel and submarines as one of the chief weapons of civilized warfare. Although its use by the Germans in the early part of the war was condemned by all truly civilized nations, the Allies without it could never have held Paris or London. An army with gas is invincible against one without it. Therefore every foresighted nation will always be provided with an ample supply in the future. This suggests of course, that the research in toxic gases, vapors, and smokes, begun at American University will be continued indefinitely. If the research is carried further, our recent discoveries will furnish an extensive field for more thorough investigation.

Among those whose efforts contributed to the brilliant success of the Chemical Warfare Service, were Major-General Wm. L. Sibert, Chief of C. W. S.; Dr. James F. Norris, M. I. T., director of organic research; Dr. McPherson, of Ohio University; Dr. Henderson, of Yale; Dr. Kohler, of Harvard, and Dr. Bell of our own University. Dr. Bell was connected with the Dispersoid Section of the Research Division. His work dealt with the utilization of smoke screens and artificial mists. Due credit must also be given to the great number of patriots who sacrificed their lives in the chemical laboratories. All who took a part in making these great discoveries deserve equal credit for the elevation of Chemistry to its new sphere.

Necrology

JAMES WILLIAMS SCOTT

The death of James Williams Scott occurred early in October, 1918, following complications from influenza-pneumonia. Mr. Scott was employed by the E. I. DuPont de Nemours Company. He was doing organic research work at their Eastern Laboratory at Gibbstown, N. J., at the time of his death.

Mr. Scott was 29 years old, having been born on March 27, 1889. His home was in Greenwood, S. C. He received his college education at Wofford College, receiving his A.B. there in 1909. After teaching high school for 3 years he resumed his studies at Vanderbilt University, and received his M.A. from there in 1913. He then returned to Wofford, and taught Chemistry there for two years.

During 1916, 1917 and 1918, Mr. Scott was appointed as the Ledoux Fellow in organic chemistry at the University of North Carolina. He was assistant in qualitative analysis during the term 1916-1917, and was reader in industrial chemistry during 1917-1918. During his two years at the University, Mr. Scott was pursuing organic research work leading to the doctor's degree, and on leaving the University in September, 1918, he had completed the required work for his doctorate, and he was to have received his degree at the coming commencement.

His untimely death came as a great shock to the department for he had been away from the University only a few weeks. While here, Scott won the admiration and esteem of all those who knew him, by his untiring efforts and his ever-perseverant nature in the pursuit of his research work. Not to be outdone by the difficulty of the task before him, he succeeded finally in preparing and analyzing more than a dozen halogen substitution derivatives of juglone. Although he was always industriously engaged he had a pleasant "hello" for every one he met, and he was ever ready to lend a hand to the many under-graduates who would come to him for his able advice and assistance. His passing has deprived us all of a true friend and an able scholar.

HAMPDEN HILL, '08

BY H. G. SMITH

It was with sincere regret that the friends of Hampden Hill learned that he had died as the result of burns received in an explosion in his laboratory.

Hill was the head research chemist for the Texas Company at Bayonne, N. J., and gave promise of becoming the chief spirit of the company. He received the degree of B.S. in 1908, and M.S. in 1911 from Carolina.

Honors: Secretary North Carolina Alumni Association; varsity track; chief ball manager; assistant in chemistry; president of the graduate student's club; member of the Merchants and Manufacturers Club, Greensboro; D.K.E. fraternity, and New York Bachelors Club.

ROBERT PATRICK HENRY

Upon our return to the Hill after the holidays, it was with genuine regret that we learned of the death of our fellow student, Robert Patrick Henry of Winston-Salem, N. C., who died of tuberculosis at Martinsville, Va. Pat was prepared for college at Winston High School and entered here in 1916, registering in chemical engineering. He was very active in athletics and in social affairs; in his chemistry he bid fair to become great in his profession. His was an attractive personality for the number of his friends was limited only by those who knew him. He was a member of Delta Kappa Epsilon and Alpha Chi Sigma.

DIRECTORY OF THE GRADUATES OF THE DEPARTMENT OF CHEMISTRY OF THE UNIVERSITY OF NORTH CAROLINA

Last year return cards were sent to all Alumni of the Department for them to fill out and return, giving their address and occupation. This year this has not been done, and in cases where the present address is not known, their home address is given. The other addresses are those we last heard from and in most cases are correct. Any corrections, additions and suggestions will be greatly appreciated by the editors.

- Allen, Miss Daisy, '07.....Raleigh, N. C.
State Laboratories.
- Allen, W. M., '93.....526 North Wilmington St., Raleigh, N. C.
State Food and Oil Chemist.
- Allen, Lieut. R. T., M.S., '08...Am. Exp. Forces, France, via New York
First Lieutenant, 10th Engineers, Forestry.
- Andrews, T. M., M.S., '17.....811 North Adams St., Wilmington, Del.
Chemist, DuPont Powder Company.
- Asbury, J. J., '00.....Home Address: Charlotte, N. C.
- Baskerville, Charles, Ph.D., '94.....14th St. and Convent Ave., N. Y.
Head of the Department of Chemistry, College of the City of
New York.
- Battle, H. B., Ph.D., '87.....103 Court Street, Montgomery, Ala.
Battle Laboratory.
- Bagwell, J. Ed., '13.....Henderson, N. C.
Receiving Clerk, Henderson Cotton Mills.
- Beldon, A. W., '97.....Woodlawn, Penn.
Supt. Coke Oven Dept., Jones & Laughlin Steel Company.
- Belden, L. DeK., '10.....Am. Exp. Forces, France, via New York
First Lieutenant Evacuation Ambulance Co., No. 2.
- Bennett, H. H., '03.....Washington, D. C.
Bureau of Soils.
- Bohannon, E. F., '04.....806 Empire Building, Atlanta, Ga.
- Boyst, W. M.,Greensboro, N. C.
Gate City Candy Company.
- Bransford, Charles, '06.....Ensley, Ala.
Gulf States Steel Company.
- Brinkley, L. L., '07.....Raleigh, N. C.
State Soil Survey.
- Bryan, Paul R., '13.....Cor. Wilson and Mills Ave., Clairton, Pa.
Chemical Engineer, Supt. Naphthalene Refining Company, Car-
negie Steel Company.
- Burns, R. P., '07.....Home Address: Wadesboro, N. C.
- Carroll, D. M., Student, '15-'18.....Chapel Hill, N. C.

- Carter, C. B., Ph.D., '16.....Pittsburgh, Pa.
Fellow in Mellon Institute.
- Catlett, G. F., '03.....Am. Exp. Forces, Military P. O. 706.
Captain. U. S. A.
- Cauble, D. Z., '00.....1501 13th Ave., South Birmingham, Ala.
Salesman, Industrial Loan and Savings Company.
- Chadbourn, G., '00.....Deceased.
- Clark, Rev. Thomas, '06.....6363 St. Charles Ave., New Orleans, La.
Professor of Chemistry, Loyola University.
- Conroy, F. D., '14.....Home Address: Cullowhee, N. C.
- Coopersmith, S., '10.....Cleveland, Ohio
Saint Vincent's Charity Hospital.
- Coulter, Victor A., Ph.D., '16.....Home Address: Newton, N. C.
First Lieutenant, Sanitary Corps, U. S. National Army.
- Cowell, C. F., '12.....A. G. O., War Department, Washington, D. C.
Lieutenant U. S. National Army.
- Cox, H. M., '14.....Dover, N. J.
Hercules Powder Company.
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Chemist, DuPont Powder Company.
- Dancy, F. B., '81.....922 St. Paul St., Baltimore, Md.
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City Editor of *Greensboro News*.
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Assistant Professor of Chemistry, U. N. C.
- Drane, F. P., '06.....Died 1918.
- Edwards, V. C., Ph.D., '15.....205 Dartmouth Ave., Swarthmore, Penn.
Research Chemist, E. I. DuPont de Nemours Company.
- Farmer, L. J., '16.....Home Address: Wilson, N. C.
United States National Army.
- Feild, Alex L., '11.....2403 Washington Boulevard, Chicago, Ill.
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New York Experiment Station.
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Operating Clarksville Foundry and Machine Works.
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ton, D. C.
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- Graham, J. O., A.M., '13.....Lebanon, Tenn.
Professor of Chemistry, Cumberland University.

- Graham, N. R., '04.....Died 1914.
- Gudger, H. C., Student, '14-'16.....Asheville, N. C.
- Hall, Lieut. R. B., '11..Apt. 41, 3145 Mt. Pleasant St., Washington, D. C.
Chemical Service Section.
- Hall, L. C., '16.....National City, Col.
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Medical Student at the University of Pennsylvania.
- Harris, I. F.233 Harrison Ave., New Brunswick, N. J.
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- Hart, F. B., '13.....Raleigh, N. C.
Department of Agriculture.
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Fertilizer Chemist, Department of Agriculture.
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- Hill, Hampden, '07.....Deceased.
Research Chemist, Texas Company.
- Hill, Hubert, M.S., '08.....Morganton, West Va.
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- Hoke, C. B., '13.....53 New Street, Dover, N. J.
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- Hoyle, A. H., '06.....2122 Ave. H, Ensley, Ala.
Steam Engineer, T. C. I. and R. R. Company.
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Meteorologist Class, U. S. N. R. F.
- Hunter, W. S., '07.....Ensley, Ala.
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- Ingram, Lieut. Hal. B., '16.....Camp Jackson, S. C.
Lieutenant, 321st Infantry.
- Isley, R. B., '17.....A. G. O., War Department, Washington, D. C.
Aviation Corps.
- Irwin, J. P., '04.....Hopewell, Va.
Chemist, DuPont Powder Company.
- Jackson, J. Q., '08.....Raleigh, N. C.
Department of Agriculture.
- Jeffries, W. L., Ph.D., '15.....Died 1917.
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United States Army.
- Johnston, G. A., '04.....Chapel Hill, N. C.
Farming.
- Jordan, Stroud, Ph.D., '09.....544-60 Park Ave., Brooklyn, N. Y.
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Chemist, T. C. I. and R. R. Company.
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- Kluttz, Warren, '99.....Sheffield, Ala.
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41st Street, New York.
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- Leonard, G. F., '07.....31 Second Avenue, Highland Park, New
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- Lockhart, L. B., '04.....33½ Auburn Ave., Atlanta, Ga.
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- McRae, Duncan, '09.....27 Delaware Ave., Bloomfield, N. J.
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- Manning, I. H.Chapel Hill, N. C.
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- Marriott, W. McKimSt. Louis, Mo.
Professor of Diseases of Children, Wash. Univ. Medical School.

- Meridith, B. L., '18.....Box 887, Wilmington, Del.
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- Moss, E. G., '02.....Oxford, N. C.
Department of Agriculture.
- Marsh, L. G., '17.....3034 Cambridge St., Washington, D. C.
Gas Chemist, Bureau of Mines.
- Nash, T. P., '10.....Memphis, Tenn.
Instructor of Chemistry, Medical College.
- Oates, W. M., '09.....Died 1918.
- Oldham, W. H., '05.....Ensley, Ala.
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- Orr, M., '08.....Charlotte, N. C.
Automobile business.
- Paddison, George L., '05.....Home Address: Burgaw, N. C.
Salesman, West Publishing Company.
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Technical Superintendent, Gunn's Ltd.
- Phillips, William B., Ph.D., '77.....Houston, Texas.
Mining Engineer, Specialty, Oil and Gas.
- Pickett, O. A., '16.....76 Morris St., Dover, N. J.
Chemist, Hercules Chemical Company.
- Pogue, J. E., S.M., '07.....University Club, Evanstown, Ill.
Geologist, Northwestern University.
- Prior, W. S., '02.....Ensley, Ala.
- Pritchard, W. N., Jr., '15.....4411 Washington Ave., St. Louis, Mo.
Cotton Inspector for DuPont Powder Co. at Rivers Spinning Co.
- Rawlins, L. D., '16.....Wilson, N. C.
Asst. Manager and Secretary Wilson Ice and Fuel Company.
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Signal Corps, U. S. A.
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Department of Agriculture.
- Roberts, J. C., '84.....Golden, Col.
Professor in Colorado School of Mines.
- Root, A. S., '01.....Raleigh, N. C.
- Rudisill, W. A., S.M., '14.....Greenville, Pa.
Professor of Science in Thiel College.
- Sawyer, J. P., '18.....Graduate Student, Chapel Hill, N. C.
- Sifford, Ernest, '05.....Eldorado, N. C.
Manager of Rich-Cog. Mining Company.

- Skinner, J. J., '03.....7217 Blair Road N. W., Washington, D. C.
Ph.D. American University, June, 1917. Biochemist, United
States Department of Agriculture.
- Sloan, C. H., '06.....Home Address: Belmont, N. C.
- Smith, W. A., '09.....Home Address: Norwood, N. C.
- Southland, L. G., '09.....Union, S. C.
Lawyer.
- Sparger, R. W., '11.....Camp Jackson, S. C.
Lieutenant, 318 Field Artillery, U. S. A.
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- Stem, F. B., '07.....Guantanamo, Cuba.
Chemist, Guantanamo Sugar Company.
- Stevenson, Capt. Reston, '02...Am. Exp. Forces, France, via New York.
Captain, Sanitary Corps, U. S. N. A.
- Strowd, W. H., '09.....Madison, Wis.
Head of Feed and Fertilizer Control for the State.
- Struthers, J. A., '14.....15 Hoogland, Dover, N. J.
Chemist, Hercules Powder Company.
- Tennant, G. R., '17.....James River Y. M. C. A., Hopewell, Va.
Electrician, DuPont Powder Company.
- Thies, D. A., '91.....Died 1908.
- Thorpe, J. B., '03.....P. O. Box 614, Gary, Ind.
Illinois Steel Company.
- Thorpe, L. S., '17.....A. G. O., War Department, Washington, D. C.
United States Army.
- Tillett, E. N. Student, '09-'10.....Timberlake, N. C.
Farming.
- Townsend, Jackson, '13.....Boston, Mass.
A. D. Little Laboratories.
- Turrentine, J. W., '01.....Washington, D. C.
Bureau of Soils.
- Tyson, J. J., '05.....Childersburg, Ala.
General farming and stock raising.
- Venable, C. S., '10.....Charlottesville, Va.
Adjunct Professor of Chemistry, University of Virginia.
- Weaver, Capt. F. R., '13.....Watertown, N. Y.
Captain, Ordnance Department, U. S. A.
- Miller, N. R.c/o Garrett & Co., Bush Terminals, Brooklyn, N. Y.
Vice-President Garrett & Company.
- Whitaker, DeBerniere, '93.....Box 383, Santiago de Cuba.
Vice-President and General Manager, Juragua Iron Company
and Spanish American Iron Company.
- Whitaker, Spier, '02.....Dead.
- Whitaker, W. A., '04.....Lawrence, Kansas.
Professor of Chemistry, University of Kansas.
- Wilkes, J. Frank, '83.....140 W. Morehead St., Charlotte, N. C.
Manager Mecklenburg Iron Works.
- Willard, C. W., '11.....Winston-Salem, N. C.

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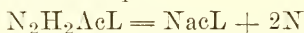
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